have our whole population reduced to a similar condition to that of the inhabitants of the district in Liverpool alluded to.

"In certain localities the crowding of the population is even greater than this. One instance out of a number of others is given of a court in Crosbie-street, containing 118 inhabitants on an area of 150 square yards, or about one square yard and a quarter to each. The average of inhabitants is nearly seven to each house, while in the court alluded to it is fifteen to each, and Dr. Duncan states that there are entire streets where the average is nearly as high. If we descend into these abodes of all wretchedness, the cellars, we find that when the families are shut up for the night, thirty individuals are furnished with a supply of air sufficient only for the wants of seven. This part of the subject might be illustrated to a greater extent had we space for the purpose.

"The whole of the cellar population of the parish (upwards of 20,000) are absolutely without any place of deposit for their refuse matter. Of the front houses inhabited by the working classes, a large proportion are in a similar predicament. 'In 26 streets, containing 1,200 houses, not less than 800 or two-thirds, were without either yard, privy, or ash-pit.' Even where such conveniences exist, they are said to be 'in an abominably filthy and ruinous condition.' They are generally so full before they are emptied, that the filth 'is deposited in the corners of the court, in the entries or back passages adjoining it, or in the street itself.' Dr. Duncan further states: 'I do not know of a single court in Liverpool, which communicates with the street or sewer by a covered drain,' the consequence of which is, that the fluid contents of the overflowing ash-pits and privies, 'spread a layer of abomination over the entire surface of the court.' In some instances the same filthy fluid 'oozes through into the neighbouring cellars (inhabited remember), filling them with its pestilential vapours, and rendering it necessary to dig wells to receive it.' One of these wells four feet deep, filled with this stinking fluid, was found in one cellar under the bed where the family slept."

Out of 57½ miles of streets, Dr. Duncan calculates that not more than 25½ miles are sewered wholly or partially, there being still 32 miles without drainage of any kind. Let us see how these 25½ miles of sewers are divided. There are 20 miles of streets inhabited by the working classes, and of these only 4 miles are drained by sewers; while of the 37½ miles of streets inhabited by other classes, 21½ miles are so drained. The element of deficient drainage also bears most heavily on the poorer classes. Such details as these shew the value of statistical inquiries, and that sanatory legislation is imperiously called for. We shall recur again to this important subject.

Ignis.

NEW BUILDINGS BILL.

A COMMITTEE of the MASTER CARPENTERS will meet at the Freemasons' Tavern, on Wednesday next, to take into further consideration the several enactments in the above-mentioned Bill.

INSTITUTE OF BRITISH ARCHITECTS.

MARCH 18.—E. B. Lamb in the chair.

A communication was read from C. Parker, containing some observations connected with Hampton Court Bridge, and the adjacent parts of the river Thames. It appears, that so late as the year 1750 there was no communication between Hampton Court and the opposite bank except by a ferry; for we learn, by an Act of Parliament about that date, that J. Clark, who possessed the manor of East Moulsey (from the reign of Charles the Second), was empowered to erect a bridge across the river, from East Moulsey to Hampton Court. The bridge was erected from the designs of S. Stephens, by B. Ludgator, and was opened in December, 1753. That bridge, however; did not remain up long, for having been built too slight to stand, or to resist the concussion of the passing craft, it was subsequently taken down. On its removal, the present bridge was erected, and although it has been repaired several times, the original form of its construction is still preserved. It is built of oak, supported by ten piers of the same material; the length is about 350 feet, and the breadth 18 feet. In 1841, it appeared that material alterations had been made in the current of the river, by the construction of Moulsey Lock, about the year 1817, and subsequently (about 1833) the construction of two wooden embankments, projecting from the north bank of the river, by which the width of the stream was reduced one-half. These obstructions had caused such an alteration in the direction of the current and the rapidity of the stream, as to occasion not only a disruption of the banks and the bed of the river, but likewise much injury to the bridge itself, from the craft being frequently driven with violence against the piers. Extensive repairs were in consequence found necessary. The main piles were strengthened with additional ones, the decayed portions being removed, and the whole bound together with wrought-iron chain-bars. Proper precautions were taken to retain the chalk in the piers, and the gravel of the platform was reduced in thickness 18 inches, in order to lighten the superincumbent weight; and the structure, though still presenting a somewhat disjointed and sunken appearance, is now firm and compact.

A paper was likewise read by Mr. F. J. Francis, "On the Chancel of Ringwood Church, Hants."—This chancel, fifty feet long and twenty-two feet broad, is (as appeared from the drawings exhibited) a fine specimen of the early Pointed style; and although, like the rest of the church, it has suffered from continued neglect, spoliation, and bad taste, enough remains to prove that the ancient builders had bestowed on it no ordinary portion of ingenuity and skill. The peculiar feature is the number of windows which it contains, there being a series of eight lofty, narrow lancet windows on each side, with deep splays, some of which bear traces of painted decorations, with a fine triple lancet at the east end, making a total of nineteen. The peculiar features of the style are well carried out in all the details. The capitals and bases of the slender Purbeck pillars, which separate the splays of the window at the east end are in the purest taste; indications of similar pillars are to be found between the windows on the north and south sides.

INSTITUTION OF CIVIL ENGINEERS.

MARCH 26.—The President in the chair.

The paper read was by Mr. C. H. Gregory, engineer of the London and Croydon Railway; it treated of "Railway cuttings and embankments, with an account of some 'slips' in the London clay." An outline was given of the general principles which regulate the formation of railway cuttings and embankments, illustrating the manner in which these works are affected by the geological character of the earths employed, or that were cut through. The paper then gave a detailed history of some heavy slips in the London clay, which had occurred, under the observation of the author, on the London and Croydon Railway, and described the means adopted for clearing the railway from the immense masses of clay with which it was covered, to a depth of from ten to twelve feet, and for enabling the passenger-trains to run without hindrance, during the time of repairing the damage.

The cause of these slips was then fully considered, and it appeared evident that in nearly every case they proceeded from the combined action of air and water; the latter entering, in the rainy seasons, by the cracks formed by the drying action of the former, until the mass of upper yellow clay being detached, moved by its own weight, and sliding upon the blue clay, the surface of which was rendered semi-fluid by the percolated water, was precipitated into the cutting.

The means adopted for preventing the recurrence of such events were fully considered, particularly the introduction of gravel buttresses and revetments through and at the foot of the slips, a system which had been perfectly successful.

In the discussion which ensued, the means adopted were generally approved of; many instances were given of the use of similar gravel buttresses on other railways; the importance of extensive surface-drainage, and of freeing from water the slopes and embankments, was insisted on; the interesting question of the "creep," or presumed rising of the floor of old mines, was examined, and it was contended that, in almost all cases, it was the roof, or upper rocks, that sunk down. The case of the village of Wallsend was instanced, which place had been sunk vertically between sixteen and twenty-four inches, in consequence of the excavation of the coal from beneath it, by the mines under the direction of the late Mr. Buddle.

The further discussion of the question was adjourned until the next meeting, April 2nd, when the monthly ballot for members was announced to take place, and the following papers will be read:—

No. 661. "Account of the Railway from Amsterdam to Rotterdam, and of the principal works upon it," by Le Chevalier F. W. Conrad, M. Inst. C. E., translated from the French by C. Manby, secretary.

No. 660. "Description of the Piling Machine, used at Montrose Harbour Works," by G. T. Page, Assoc. Inst. C. E.

No. 673. "Account of a series of experiments on the comparative strength of solid and hollow axles," by C. Geach.

THE ROYAL INSTITUTION.

MARCH 15.—Lord Prudhoe, president, in the chair.

Mr. Cowper "On Signals and Telegraphs." The object of his communication was to exhibit the method of holding intercourse at a distance, by means of conventional symbols, whether on land or at sea. The lecturer distinguished *telegraphs* (consisting of machines more or less complicated) from *signals*, which are simple constructions, as beacons, flags, &c. Having noticed the allusions to beacons by the sacred writers, many centuries before the Christian era, Mr. Cowper proceeded to describe the present improved state of the methods of distant communication. *Signals*—These comprise, 1st. The method, now brought to great perfection, of signalling letters, words, or entire sentences, &c., by means of a series of flags of different patterns, as used by the Royal Navy or by merchant vessels; 2nd. Hieroglyphics, or manual telegraphs, consisting of the use of basket-work, held in different positions, or, as is practised on railroads, the human arm extended in various attitudes; 3rd. A plan invented by Mr. Cowper's son to give notice to the driver of a locomotive engine of the approach to a station, or an accident in foggy weather; this consists of a small case of gunpowder in which is inserted a kind of lucifer match; this is fastened to the rail at the spot where the alarm is to be given, and as the wheel of the engine goes over it, it explodes, and the driver instantly shuts off the steam. The lecturer noticed that the explosion, though not loud when compared with the noise of the train, attracted attention by the difference of the sound. *Mechanical Telegraphs*—Mr. Cowper gave a history of these curious arrangements, beginning with the telegraph invented by Hook in the seventeenth century, and then proceeded to exhibit models of the construction of Mr. R. L. Edgeworth—of the shutter telegraph, used by the government for many years, till superseded by the invention of Sir H. Popham, the present Semaphore. This instrument was compared with the Telegraph long used by the French. *Electrical Telegraphs*—Mr. Cowper concluded by exhibiting working models of the forms of these instruments, now used on the different railroads, and a magnetic electric machine, superseding the necessity of a galvanic battery; and lastly, a machine by Professor Wheatstone, for making the telegraph print on paper the message which it delivers.

ABERDEEN HARBOUR.—We understand that the working plans of the Harbour improvements, with the relative specifications and other documents, are now in a state of great forwardness. From the extent and variety of the contemplated works, much time and labour have been expended in making out the necessary details; and we are happy to learn that matters are now so far advanced that there is every prospect of contracts being advertised for in the course of the ensuing month.—*Aberdeen Herald.*

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